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Washington Department of Wildlife

Serving Washington's wildlife and people- now and in the future.

Cowlitz River Fish & Wildlife Mitigation Programs

The Cowlitz River is one of the largest river systems in the state. A tributary to the Columbia River, the Cowlitz system stretches from Mount Ranier to Longview where it flows into the Columbia. The Cowlitz has historically produced large runs of winter-run steelhead, sea-run cutthroat and chinook. The basin supported healthy populations of black-tail deer, elk, furbearers, eagles and numerous other wildlife species.

Hydroelectric projects brought substantial change to the river. Rich habitats were lost. Productive rearing areas for fish, waterfowl and furbearers were flooded which in turn reduced fish runs and wildlife populations.

Two hydroelectric projects - Tacoma City Light's Mayfield and Mossyrock dams - were built on the Cowlitz creating Mayfield and Riffe lakes respectively. A Barrier Dam was also built below Mayfield Dam at the Cowlitz Salmon Hatchery to trap returning anadromous fish. Currently, Lewis County PUD is developing a hydropower project on the upper stretches of the Cowlitz at Cowlitz Falls.

Federal licenses issued to utilities operating hydroprojects requires them to provide for fish and wildlife losses due to project impacts. The Department of Wildlife has been working with Tacoma City Light for many years to develop a Cowlitz Fish and Wildlife program. The fish program includes an anadromous program for steelhead and sea-run cutthroat as well as a resident program in the upper Cowlitz River and Riffe and Mayfield Reservoirs.

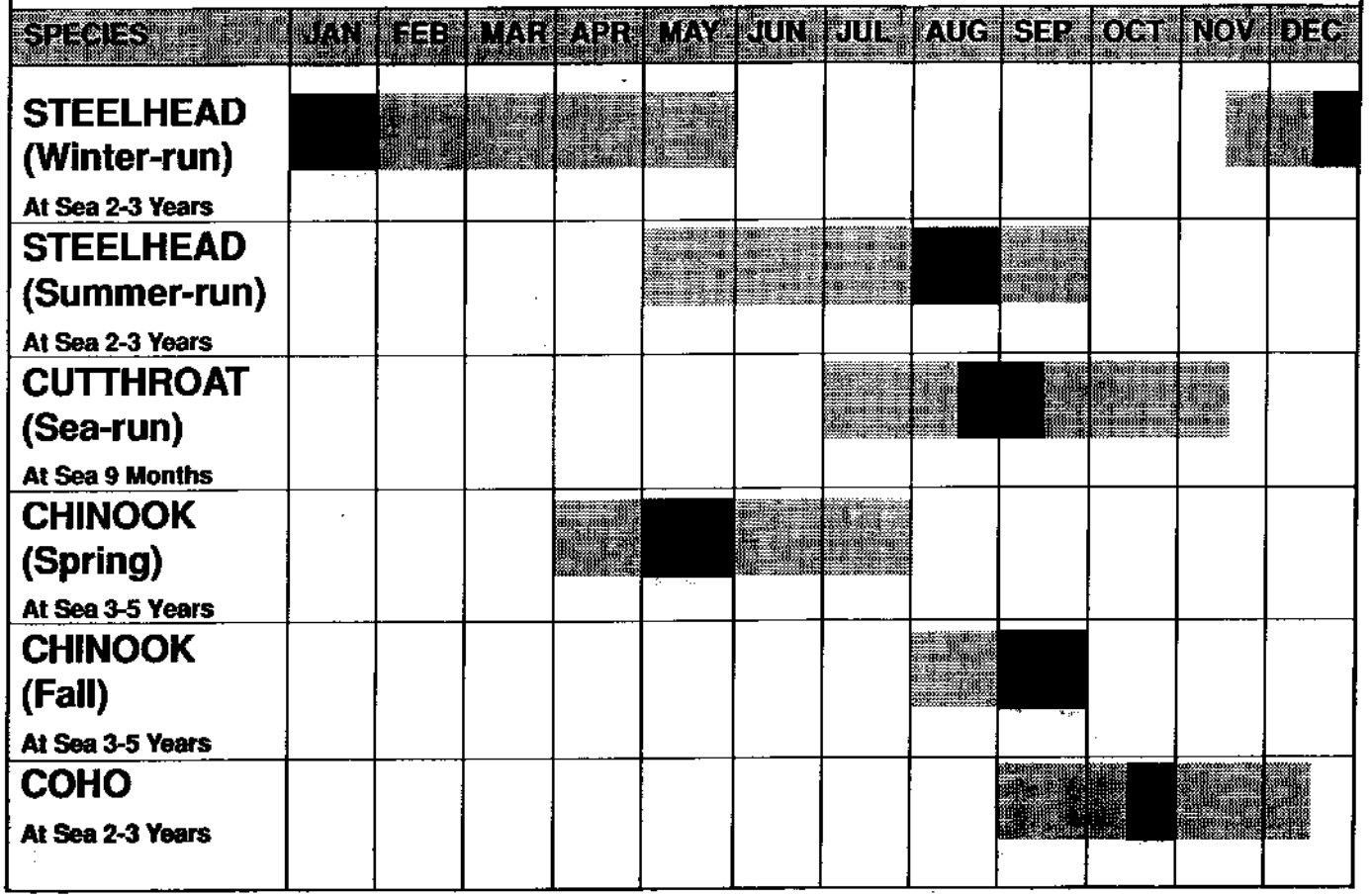
FISHING ON THE COWLITZ

The Cowlitz River has been Washington's top winter steelhead producer fot 17 of the last 19 years. In 1988-89, 8,651 winter steelhead were caught while the second ranked Skykomish River had 3,621. Effective mitigation efforts can improve Cowlitz production and catch rates.

Summer steelhead were, historically, a very small part of the Cowlitz fishery. Anglers caught 2,345 summer steelhead during the 1988-89. Disease losses severely impacted sea-run cutthroat numbers and forced an emergency closure on the fishery. Last year, 383 fish returned to the hatchery. This year is much brighter for sea-run cutthroat with biologists estimating 10,000 fish will return to the hatchery.

Steelhead anglers work the Cowlitz from Longview upstream to the Barrier Dam. When the fish are in, most anglers focus their effort on two areas - the "Blue Creek hole" just downstream from the Cowlitz Trout hatchery and upstream at the Barrier Dam. Both boat and bank anglers fish the Cowlitz throughout the year. The following Upstream Mitigation Chart helps explain when steelhead, cutthroat trout and salmon are in the river.

COWLITZ RIVER UPSTREAM MIGRATION CHART



MONTHS FISH ARE RETURNING

PEAK OF RUN

10/89

Steelhead and Sea-run Cutthroat Mitigation Levels and Program Plans

The best news for the future of steelhead and sea-run cutthroat programs on the Cowlitz will be the installation of the ozone treatment system in June, 1990 reducing disease impacts of Ceratomyxa shasta. Fish disease problems and the ozone system are explained later in this handout.

STEELHEAD

The ozone treatment system should reduce disease losses at the Cowlitz hatchery and increase production levels to meet mitigation goals. Biologists are also working to improve fishing opportunity and harvest rates between the Barrier Dam and the Blue Creek hole.

The fishing hole just below the Barrier Dam has been enlarged creating more room and hopefully spreading out fish that normally congregate in this area before they reach the dam.

A larger proportion of the winter-run smolts (young fish ready to migrate toward the sea) will be released at the Barrier Dam instead of at Blue Creek. When these fish return, many are anticipated to home in on the Barrier Dam rather than the Blue Creek hole - spreading fishing opportunity from Blue Creek to the Barrier Dam.

Excess fish that reach the Cowlitz hatcheries are trapped, transported downstream and released back into the river. Fish are released in several areas to increase fishing opportunity and spread out anglers.

SEA-RUN CUTTHROAT

Sea-run cutthroat are highly susceptable to ceratomyxa with mortalities reaching as high as 96% due to this disease. Severe losses required an emergency closure of the 1988 sea-run cutthroat season.

The installation of the ozone treatment system should greatly enhance this fishery.

STATUS OF COWLITZ MITIGATION LEVELS

	Adult Steelhead Summer-run	Adult Steelhead Winter-run	Adult Sea-run Cutthroat
5-Yr Ave. goal	6,600	22,000	10,000
84-85	1,278	16,102	3,323
85-86	1,286	10,989	1,385
86-87	6,313	17,270	965
87-88	4,974	11,724	508
88-89	2,345	8,651	383
AVERAGE	3,239	12,947	1,313
% GOAL	70	84	26

COWLITZ PRODUCTION LEVELS

	Juvenile Steelhead Summer-run	Juvenile Steelhead Winter-run	Juvenile Sea-run Cutthroat
5-Yr ave. goal	220,000	750,000	80,000
85	114,116	698,249	58,514
86	113,325	372,169	20,135
87	56,908	759,043	6,837
88	82,153	523,777	10,336
89	222,764	815,224	88,939
AVERAGE	123,853	633,692	36,952
% GOAL	56	84	46

Fish Diseases and Impacts

IHN (Infectious Hematopoietic Necrosis) is a viral disease that has resulted in large fish losses at hatcheries. The Cowlitz and Skamania hatcheries have lost millions of fish due to IHN outbreaks. The life-cycle of this virus is not fully understood and there are no known cures. Biologists believe IHN is spread through ovarian fluids of spawning fish. Fish spawning above the hatchery may release IHN virus into the water that is used for rearing fish resulting in hatchery fish being infected. To prevent this, biologists try to inhibit fish from going above a hatchery's water intakes where possible.

When fish are spawned at the hatchery female ovarian fluids and eggs are tested for IHN. All eggs at the Cowlitz hatchery are disinfected to reduce risks to the resource.

To reduce IHN risks at the Cowlitz Salmon Hatchery, steelhead and salmon are not allowed to go above the Barrier Dam. Exception to this are coho salmon planted each year in Riffe Lake. Because findings suggest Coho salmon can transmit IHN, all Coho planted in Riffe are tested for IHN to make sure infected fish are not released above the dam.

VHS (Viral Hemorraagic Septicemia) was isolated in a hatchery on the Sooez River in spring of 1989. This is the first time this disease has been isolated in North America. VHS has not been found at the Cowlitz Hatchery. VHS could have substantial impacts on Pacific Northwest fish populations and economies. It is believed the virus came from Europe - where trout populations have suffered severe losses from the disease. WDF and WDW biologists are working with the international expert on VHS, monitoring Washington waters and facilities for further evidence of the presence of this disease.

Ceratomyxosis (Ceratomyxa shasta) is caused by a microscoptic parasite in the intestine of the fish. C. shasta has had huge impacts on Cowlitz sea-run cutthroat populations. In 1988, the Cowlitz hatchery lost 96% of its sea-run stock. (Mortality rates for sea-run cutthroats without C. shasta is closer to 10%.) The severe reduction in hatchery stock led to a record low return in 1988 of 383 fish.

Because this parasite occurs naturally in river water and the Cowlitz hatchery must rely upon the river as its main supplier of water, the fish raised in the hatchery are in high risk situations. To reduce these risks, a system will be installed to purify the hatchery water supply with ozone treatment - killing the infectious stage of the parasite before it contacts hatchery fish.

OZONE TREATMENT

A two-year pilot study of ozone treatment showed that 90% of fish reared in ozone-treated water survived while only 20% survived when raised in untreated raw river water. Ozone (O_3) is a gas that can be electrically generated and diffused into water for purification.

Tacoma City Light is installing an ozone treatment system at the Cowlitz hatchery with the capacity to treat 10,000 gallons of water per minute. Water entering the hatchery has ozone gas added to it which kills many parasites and viruses. Target start-up date for the ozonation system is June, 1990. Cost of the system is expected to be two million dollars.

Resident Fish Program

UPPER COWLITZ

Goal: Maximize harvest and provide recreational fishing to the communities of the upper Cowlitz River by releasing trout in streams in the area. Early production of these fish was done at the Cowlitz Trout Hatchery until it was curtailed in 1981 due to disease (IHN) outbreaks. Since 1981, these fish are produced at Mossyrock Trout Hatchery under a temporary agreement with Tacoma City Light. Water and space restrictions at the hatchery prevented TCL from reaching mitigation levels.

Approximately 120,000 rainbow trout are planted in the upper Cowlitz system. Fish were planted every two weeks in Yellow Jacket Ponds, Skate Creek, Tilton River, N. Fork Cispus River, Clear Fork Cowlitz and Klickitat Creek.

TROPHY TROUT

Goal: Develop a fishery that provides trophy-sized trout in the Cowlitz River above Mayfield and Mossyrock Dams. The Department of Wildlife is working with Friends of the Cowlitz and Lewis County PUD to develop this exciting program for the upper river.

Proposed targets suggest releasing 20,000 two-year old fish, 10,000 three-year olds and 10,000 four-year olds. Projected start-up date could be 1991 or 1992 depending upon purchase and development of a hatchery site. Stocking of the two year old fish could begin in 1993 or 1994.

Releasing hatchery fish in the same streams where wild fish exist can cause serious declines in wild populations. Release sites will be carefully selected and trophy trout will be released in streams that already receive hatchery plants.

COWLITZ RESIDENT FISH

1988 Production

Upper Cowlitz Trout	120,000
Riffe Lake Trout	90,000
Riffe Lake Coho	1,000,000
Mayfield Trout	90,000
Mayfield Tiger Muskies	8,000
Swofford Trout	2,000
% GOAL	96.7

RIFFE LAKE

Goal: Maintain a productive fishery of coho salmon, cutthroat trout and rainbow trout while allowing a trophy opportunity for brown trout. Every year, Riffe Lake is planted with 1,000,000 coho and 90,000 trout.

MAYFIELD LAKE

Goal: Establish a recreational fishery in this reservoir.

Mayfield presents a dilemma to biologists trying to establish a productive fishery there. The water temperature is unusually cold because the warmer surface water is siphoned off over the dam. These conditions benefited "roughfish" populations like squawfish and suckers. Large numbers of these predators roam Mayfield targeting on the trout and coho planted for anglers. Mortality rates of fish released in Mayfield has been as high as 100%. Biologists believe these losses are due mostly to the large sqauwfish populaiton. These constraints have severely hampered establishing a fishery at Mayfield.

TIGER MUSKIES AT MAYFIELD

Biologists have introduced Tiger Muskies, also known as "Water Wolves," into Mayfield in hopes these predators will turn the tables on squawfish. A three year study began in 1988 to determine if tiger muskies can reduce the squawfish population allowing a rainbow fishery to take hold in the lake.

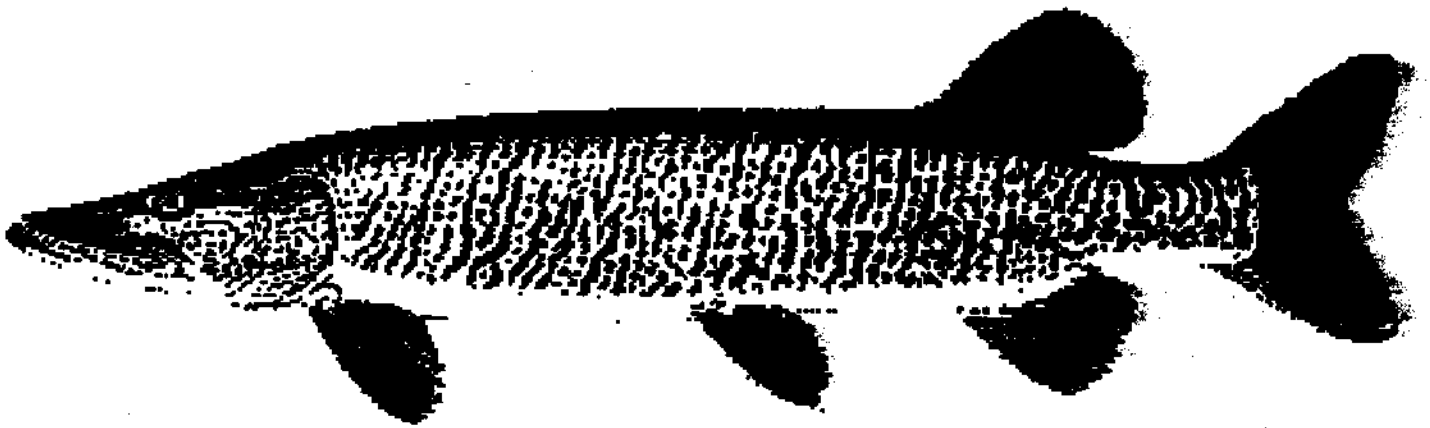
Tiger muskies have a voracious appetite. While raised at the hatchery, the young fish required feeding every five to 10 minutes - 24 hours a day. (It was not uncommon for the young tiger muskies to turn on their siblings if feeding time did not match their hunger pangs.)

In addition to keeping the squawfish in check, tiger muskies could provide Mayfield with an exciting fishery. Tiger muskies, brought from the Midwest, are a cross between the northern pike and the muskelunge. They are an extraordinary sport fish - growing to over 30 inches and weighing from 25-35 pounds.

The tiger muskie program was started in 1988 with a plant of 6,100 fish. An additional 8,000 tiger muskies will be planted in 1989 and 90. The department is developing a proposal to add two years onto the study, planting 8,000 tigers in 1991 along with 100,000 rainbow trout. An evaluation of the program in 1991 would determine if the program would continue.

SWOFFORD POND

Goal: Maintain a warmwater fishery and a smaller trout fishery. Biologists hope to establish a bass population with a substantial number of large 12-17" fish. About 2,000 brown trout are planted annually to provide a smaller trout fishery. Channel catfish have also been established and could provide an attractive fishery at Swofford.



Restoring Wildlife Lost on the Cowlitz

Washington's wildlife populations are heavily impacted by hydropower development on the Cowlitz River. From pre-reservoir aerial photos, biologists have determined that 13,000 acres were flooded by the reservoirs. This translates into substantial habitat lost for wildlife.

Black-tail deer lost vital shelter from Cowlitz' winter weather as timbered areas around the basin were flooded. Waterfowl lost prime wetlands that had provided shelter and food for migrating as well as resident populations that stayed on the Cowlitz to raise their young. Furbearers like river otter and beaver lost wetlands and riparian habitat - extremely productive habitat along stream corridors.

Tacoma City Light's federal license requires them to compensate for habitat and wildlife losses associated with inundation. Excellent opportunities exist to mitigate for wildlife losses. Through habitat enhancement, cooperative land management agreements and planned acquisition much can be accomplished to restore wildlife habitat on the Cowlitz. Vital thermal cover for big game can be restored through cooperative land management agreements. Wetland habitat can be increased. Waterfowl food and cover can be planted. Critical riparian habitat can be protected and eagle perches can be built. There are tremendous opportunities to restore lost wildlife habitat and populations on the Cowlitz.

Tacoma City Light now intensively manages 1,500 acres of land for wildlife enhancement. These efforts represent only one-tenth of the habitat lost due to inundation. Recently the Department of Wildlife and Tacoma City Light joined efforts to quantify wildlife habitat losses from dam construction. Using a process called the Habitat Evaluation Procedure (HEP), biologists compare the quantity and quality of wildlife habitat available prior to dam construction to the habitat available after inundation. Losses are expressed in "habitat units". Each habitat unit is the equivalent of one acre of high quality habitat for a given species. The full extent and scope of this wildlife program to complete Tacoma's mitigation is still under negotiation.

Wildlife losses represent thousands of acres of land which could be managed to enhance wildlife habitat and wildife populations in the Cowliz River basin. A full-scale wildlife mitigation program needs to be implemented to take advantage of opportunities that exist in the basin today.